

AGENDA

Sustainability Advisory Committee

MEETING OF THE SUSTAINABILITY ADVISORY COMMITTEE

TO BE HELD ON

MEETING DATE



THURSDAY, 13 SEPTEMBER 2007

commencing at 6 pm

in Conference Room 3

JOONDALUP CIVIC CENTRE,
BOAS AVENUE, JOONDALUP



MIKE TIDY ON BEHALF OF

GARRY HUNT

Chief Executive Officer

7 September 2007

www.joondalup.wa.gov.au



City of
Joondalup

CITY OF JOONDALUP

Notice is hereby given that a meeting of the **SUSTAINABILITY ADVISORY COMMITTEE** will be held in Conference Room 3, Joondalup Civic Centre, Boas Avenue, Joondalup on **Thursday, 13 September 2007** commencing at **6 pm**.

MIKE TIDY ON BEHALF OF
GARRY HUNT
Chief Executive Officer
7 September 2007

Joondalup
Western Australia

AGENDA

Committee Members

Cr Michele John

Cr Sue Hart

Cr Steve Magyar

Cr Russ Fishwick

Mr Will Carstairs

Ms Melanie Barter

Ms Ute Goeft

Mr John Willett

Mr Brett Dorney

Ms Wendy Herbert

Presiding Person

Community Rep

Edith Cowan University

Community Rep

Community Rep

West Coast TAFE

Community Rep

Terms of Reference

- *To recommend to the City of Joondalup Council on policy, advice and appropriate courses of action that promote sustainability, which is (1) environmentally responsible, (2) socially sound and (3) economically viable*
- *To provide advice to Council on items referred to the Committee from the City of Joondalup administration*

DECLARATION OF OPENING

APOLOGIES/LEAVE OF ABSENCE

CONFIRMATION OF MINUTES**MINUTES OF THE SUSTAINABILITY ADVISORY COMMITTEE HELD 19 JULY 2007****RECOMMENDATION**

That the minutes of the meeting of the Sustainability Advisory Committee held on 19 July 2007 be confirmed as a true and correct record.

ANNOUNCEMENTS BY THE PRESIDING PERSON WITHOUT DISCUSSION**DECLARATIONS OF INTEREST****IDENTIFICATION OF MATTERS FOR WHICH THE MEETING MAY SIT BEHIND CLOSED DOORS****PETITIONS AND DEPUTATIONS**

- 1 Presentation by Mr Nick Turner from the Water Corporation on Underground Water Replenishment Project (refer Page 4).
- 2 Presentation by Mrs Wendy Herbert, Committee member, Sustainability Advisory Committee on The Drug Crisis and its Cost to Local Government (refer Page 5).

REPORTS

Item 1	Solar Power Technology	Page 6
Item 2	Key Performance Indicators for reducing the city's oil consumption	Page 15
Item 3	Future Sustainability Advisory Committee Structure	Page 20
Item 4	Thermal Weed Control	Page 24

MOTIONS OF WHICH PREVIOUS NOTICE HAS BEEN GIVEN**REQUESTS FOR REPORTS FOR FUTURE CONSIDERATION****CLOSURE**

1 PRESENTATION – UNDERGROUND WATER REPLENISHMENT PROJECT [00906]

WARD: All

**RESPONSIBLE
DIRECTOR:** Mr Ian Cowie
Governance & Strategy

Nick Turner is the Project Manager of the Water Corporation's Underwater Replenishment Project.

This presentation will provide an overview of this pilot project. This project aims to utilise waste water produced at the Beenypup Waste Treatment Plant (Craigie) and treat the water to a tertiary level which is then injected into the groundwater aquifer via a bore system. The pilot project has been funded by the Federal Government and if successful will produce a long-term solution for replenishing groundwater aquifers.

2 PRESENTATION – IMPACT OF DRUG USE IN LOCAL SOCIETIES [00906]

WARD: All

**RESPONSIBLE
DIRECTOR:** Mr Ian Cowie
Governance & Strategy

Wendy Herbert, will present to this Sustainability Advisory Committee meeting, an overview from the Drug Free Australia Conference - Impact of Drug Use in Local Societies.

This presentation raises a social sustainability issue that is prevalent across Australia and within Joondalup. In order to raise awareness of the drug issues within the Joondalup community, Mrs Wendy Herbert will give an overview of her presentation at the Drug-Free Australia conference held in Melbourne 2007. Wendy will point out that one in three families are currently coping with illicit drug problems. Western Australia (which includes Joondalup) has the highest consumption of amphetamine (in particular ICE) use.

This presentation will provide an overview of the current drug policy in Australia and Wendy will present some of her ideas for how the City of Joondalup can look at addressing this problem within our local community.

ITEM 1 SOLAR POWER TECHNOLOGY [00906]

WARD: All

**RESPONSIBLE
DIRECTOR:** Mr Ian Cowie
Governance and Strategy

PURPOSE/EXECUTIVE SUMMARY

To provide the Sustainability Advisory Committee (SAC) with an overview of solar power technology, potential projects the City could undertake in relation to solar power in the future and to consider options for the promotion of solar power as an energy saving measure to the community.

BACKGROUND

At it's meeting on 24 May 2007, SAC requested that a report be drafted in relation to solar energy systems.

After the Federal Government's budget announcements in May of this year, the demand for solar power systems has considerably increased in light of new government rebates for residential and community-building installations.

Despite the City's ineligibility for these rebates, it has still been noted as an opportune time for the City to consider introducing solar power technology as a means of further reducing carbon emissions and for promoting the use of renewable energy to its residents.

The City has no current solar power systems in place. However through the "Cities for Climate Protection Program" the City has undertaken many initiatives to reduce greenhouse gas consumption including the use of renewable energy.

As part of the Craigie Leisure Centre redevelopment the City installed a geothermal heating system to heat the Centre's two pools and to provide air temperature control. Whilst this system had greater capital costs when compared to other heating systems, it provided the greatest long-term savings and environmental benefit over the expected life of the project. The system is projected to provide 14,000 tonnes of CO₂-e savings over the 15 year life of the project.

Since August 2005, the City has purchased renewable energy from Landfill Gas & Power P/L whose landfill gas turbines capture and recover methane at Tamala Park. In the financial year 2006-2007, 4,583,219 kWh of renewable energy was purchased which has avoided 4,404.47 tonnes of CO₂-e.

The City's 2006 Measures Evaluation Report has quantified an abatement of 79,632 tonnes of CO₂-e abatement from 1998/99 to 2005/06. The Draft 2007 Measures Evaluation Report has estimated that the City has abated a further 61,508 tonnes of CO₂-e in 2006-07. The City has achieved this reduction by undertaking a comprehensive range of actions that have significant opportunities for abatement.

The City's Draft Greenhouse Action Plan 2007 – 2010 provides direction for reducing the City's greenhouse gas emissions over the next four years. The Draft Plan includes the following actions relating to renewable energy:

- Undertake energy audits on the top 5 emitting Council buildings and develop a priority schedule for undertaking ongoing audits of all other Council buildings;
- Further investigate the viability of utilising green power supplied from renewable energy for other Council facilities; and
- Investigate opportunities for introducing solar power lighting as pilot projects.

DETAILS

Solar power (otherwise known as “solar energy”) is radiation emitted by the sun that can be harnessed by technology to produce heat and electricity.

Solar energy requires two technological components in order for the energy to become functional. These components are a *collector* and a *storage unit*.

Types of solar energy technologies

There are three methods of collecting solar energy that are currently in use today. These are: flat-plate collectors, focusing collectors and passive collectors.

Collectors

Flat-plate collectors are the most commonly used. (Refer to Diagram 1 in Attachment 1). They consist of an array of solar panels arranged in a simple flat plane. They apply photovoltaic (photo=light volt=electricity) technology to convert solar energy into electricity through the use of semi-conductor materials (usually silicon). They can vary greatly in size and have an output that is directly related to a few variables including size, facing and cleanliness. These variables all affect the amount of radiation that falls on the collector. Some of the issues these variables encounter are potentially overcome by automated machinery that keeps the flat-panel facing the sun. The additional energy required to drive this machinery is easily offset by the additional energy captured by the panel's more efficient orientation. Flat-plate collectors require very little maintenance due to the limited amount of moving parts, which consequently increases the life of the technology to an expected 25 years. They are also suitable for urban areas due to the limited space they consume and the absence of noise when in use.

Focusing collectors are essentially flat-plate collectors with optical devices that are arranged to maximise the solar energy falling on the collector's focus area. (Refer to Diagrams 2 and 3 in Attachment 1). They are less popular than the traditional flat-plate collector and function predominantly as solar furnaces. Focusing collectors produce enormous amounts of energy at a single point, but lose some of the energy that flat-plate collectors would otherwise be able to retrieve. Another issue encountered by this type of collector is the loss of efficiency the silicon parts experience when exposed to extremely high temperatures. Permanent damage may also occur to parts if not sufficiently safeguarded. This creates additional costs in the purchase, installation and maintenance of the collector.

Passive collectors absorb solar energy and convert it to heat naturally. (Refer to Diagrams 4 and 5 in Attachment 1). All objects have this property to some extent, but only some objects will be able to produce enough heat to make it worthwhile. This natural ability is often enhanced in some way (traditionally by painting the object black) and a system for transferring the heat to a different location is added. A common use of this collecting method is the installation of black pipes on household roofs to heat pools and spas.

Storage units

Solar energy is best suited for heating, as it is the most highly efficient form of energy transformation. Heat energy is typically stored in a liquid, such as water, or in a packed bed of stones. Heat energy may also be stored in a “phase-changer” or “heat-of-fusion unit”. These storage units contain a chemical that changes from a solid to a liquid, subsequently “trapping” energy in the liquid. This energy is released when the chemical is transformed back into its solid form.

Applications

Solar energy heating is typically used in households to heat water and the water itself is utilised as the storage unit. The heating of large buildings often employs heat-of-fusion storage units, but more often than not, packed beds and hot-water tanks are the preferred models of storage due to their reduced cost. When heating a building, it is often best to combine flat-plate collectors with passive collectors to maximise the net amount of solar energy collected and reduce the purchasing costs of flat-plate collectors. Examples of passive collectors used in building heating include: incidental heat trappings, by having windows face the sun during the day; thermosyphoning walls and roofs to reroute heat into areas where the heat is most needed; and solar ponds, where bodies of water near the building are used to collect and store heat before rerouting the heat back and forth from the building to the pond.

Solar energy may also be used for cooling, but at this stage, it is incredibly expensive. It is similar to the “phase-changer” storage principle in that it involves the changing of a liquid to a gas. The resultant gas is transferred into a lower pressure chamber that lowers the temperature of the gas. The low temperature gas absorbs the heat from a room, effectively cooling the area.

One of the most popular applications of solar energy is the conversion of energy to electricity. This is achieved through photovoltaic cells (as outlined earlier in the details section of the report). Photovoltaic cells operate at a low efficiency, typically around 15%. This means that out of all the solar radiation that falls upon them, less than 15% of it is converted into electricity. The maximum theoretical efficiency for a photovoltaic cell is 32.3%, which if achieved, would make solar electricity very economical. Recent advances have enabled an efficiency of up to 28.2%, but this is only in a laboratory environment.

Types of installations for solar electricity

Grid Connected Systems interact with the electricity supply grid. They are generally located in urban areas and photovoltaics are the usual energy source. The main components of the system are the photovoltaic cells and a grid interactive inverter.

The inverter converts the low DC voltage generated by the system to the normal 240V AC building supply. It also monitors the operation of the system to control how much electricity is drawn from or fed to the grid.

If the building uses more energy than the solar panels can supply, the shortfall is provided by the grid so power is always available. If the system is supplying more energy than is needed, the excess is fed into the grid. Often the meter just “runs backwards” when electricity is going into the grid, so the household only pays for the difference between what is imported and what is exported.

Grid Connected Systems do not have storage batteries and do not provide a guaranteed continuous power supply. If the grid goes down the inverter will cut out for safety reasons and there will be no electricity available.

Off-Grid Solar Systems use solar panels to produce DC electricity which is then stored in a battery bank. An inverter then converts the DC power stored in the batteries to AC power - the kind of power found in a Grid Connected building. Sometimes, Off-Grid Systems will include a backup engine generator to charge the batteries if they get too low. Such a system can be set up so that the generator starts automatically in a low battery condition. These systems have a greater reliability for preventing a loss of continuous power, but are most often utilised in rural or remote areas due to inaccessibility to power lines. It is also more expensive to install.

New solar technologies

Sliver Cells

Sliver Cells are a new type of solar cell that uses 90% less silicon than standard solar panels. The considerable reduction in materials means that the costs of manufacturing the product are drastically reduced. The technology was developed in Australia and is currently being manufactured on a small scale at a facility in South Australia.

The process for manufacturing the cells requires “slivering” pieces of silicon into thin “wafers” to produce more silicon cells out of the same amount of material required for normal solar cell production.

The slivering of cells also increases the cell’s efficiency to over 19%; this is over 5% more than the most efficient solar cells in the market today. Further, Sliver Cells are able to continue working at their highest capacity, even if 90% of a solar panel is covered in shadow. General solar cells begin to lose efficiency after only 20% of the panel being subjected to shadowing.

Sliver Technology is anticipated to revolutionise solar energy systems in the future and will be available for purchase in about two years time.

Sliver Technology is a registered trademark of Origin Energy Solar Pty Ltd, a wholly owned company of Origin Energy Limited, Australia’s second largest energy company.

Dye Solar Cells

Dye Solar Cells are photovoltaic cells that use titania and a special dye, rather than expensive silicon crystal, to artificially recreate photosynthesis. The technology was developed in Australia and claims to be: cheaper than conventional silicon cells, translucent (so they can be used as energy producing windows) and able to work in shadowed conditions.

The technology is still being developed and tested.

Examples and case studies of solar technology use

Solar Cities

Solar Cities is a \$75.3 million initiative announced by the Prime Minister in the Energy White Paper, *Securing Australia’s Energy Future*, in June 2004. It will be

implemented by the Department of the Environment and Water Resources through trials in Adelaide and at least three other electricity grid-connected urban areas around Australia.

Solar Cities is an innovative programme which is designed to demonstrate how solar power, smart meters, energy efficiency and new approaches to electricity pricing can combine to provide a sustainable energy future in urban locations throughout Australia. It is a partnership approach that involves all levels of Government, the private sector and the local community.

Adelaide, Townsville, Blacktown and Alice Springs are the first four solar cities announced in Australia. With \$49 million of funding from the Solar Cities initiative, the Blacktown, Adelaide, Townsville and Alice Springs Solar City consortia are working with industry, businesses and their local communities to rethink the way they produce and use energy.

Melbourne Council House – “CH2”

CH2 is a 10-storey office building for 540 City of Melbourne staff, with ground-floor retail spaces and underground parking. It was officially opened in August 2006 and boasts 11.3 million dollars worth of sustainability features, including photovoltaic cells and light harvesting devices.

The total cost of the project was \$51.045 million that is anticipated to be paid back, through reduced energy costs, within 10 years. Electricity costs of the City have reduced by 85% due to the sustainable features of the Council Building. Gas has reduced by 87% and water by 72%.

Moreland City Council - Victoria

Moreland Council is encouraging residents to take up green power options, working with the community to reduce waste, ensuring that recycled materials are used in new buildings and promoting environmentally friendly design.

Moreland Energy Foundation Ltd (MEFL) is an independent, not for profit organisation established by Moreland City Council to help reduce greenhouse gas emissions across the municipality. Established after the forced sale of Council owned electricity retailers, MEFL is the first independent, locally based organisation in Australia devoted entirely to reducing community greenhouse emissions.

Since 2001, MEFL has worked with households, businesses, schools and community groups to reduce wasteful energy use, save money on power bills and make buildings more comfortable to live and work in year round. As well, Council continually strives to find ways to further reduce its own energy consumption and greenhouse gas emissions through review of Council buildings and practices.

Moreland City Council aims to reduce greenhouse emissions from its operational energy use by 40 per cent by the year 2010.

Already, it has reduced emissions by 20 per cent from various actions, most significantly by purchasing Green Power for eight of its largest buildings.

Redland Shire Council – Queensland

Queensland's Redland Shire Council has undertaken two projects using solar powered lighting. It contracted Orion Solar Solutions to supply and fit marine

navigation lights in Council's waterways in Moreton Bay and to supply and install ten self contained solar powered bollards to illuminate the pathway of a major Council park.

The units were installed in minutes, requiring no trenching for power cables and the lights switch on automatically at dusk and off at dawn. With virtually no maintenance and no running costs, the bollards are a fraction of the cost of traditional hard-wired electrical bollards.

In another project, a GI-100 solar powered LED lighting system was installed to illuminate a public easement between a residential street and a shopping centre. The system is frequently used to illuminate bus shelters, picnic sites and other outdoor facilities.

Issues and options considered:

Pros of solar power technology: It is a "green" source of energy that effectively reduces carbon emissions and energy costs, creates potential savings in the future and contributes to an overall healthier environment.

Cons of solar power technology: It can be considered by some as visually unattractive, considerably expensive to retrofit and unbeneficial to pursue in the near future due to up-and-coming technologies that are more efficient and less expensive.

Corporate opportunities for solar energy use

Solar energy systems are not a form of technology that many local governments have introduced or utilised to date. Therefore it is difficult to compare the approaches of other Councils in their uses of solar technologies.

Some suggestions for potential solar energy applications at the City include:

- *Photovoltaic cells on Council buildings:* This will be a considerably expensive project, as current rebates and funding do not target local governments. Also, more efficient and less expensive technologies will be available in the near future, so to commit to retrofitting projects now may not be a financially sound decision.
- *Solar bore pumps:* The use of this technology for the City's bores is currently not a financially viable option given the high cost associated with the systems. Continuing investment and improvements in the area of solar power is likely to reduce the cost of these systems in the future.
- *Solar power lighting:* Solar power lighting can either be connected to the grid or can operate off-grid with the use of batteries. The application of this technology has been limited to off-grid areas where the cost of extending the grid is prohibitively high; the economic distance for cabling is 400m. However, there are still significant capital costs associated with installation whether it is on or off-grid.

Community opportunities for solar energy use

- *Community awareness:* Some may argue that the most appropriate role for local governments to play regarding solar power systems is to raise community awareness about the technology. This may include: the production of information sheets explaining how the technology works, the types of systems available for residents to install in their homes, a system for fast-tracking building approvals for

solar technology installations and guidelines that outline the necessary process for obtaining building approval for system installations.

- *Installation rebates:* In light of the current \$8,000 rebate the Federal Government is offering residents to install solar power technology in their homes, it would seem unnecessary for the City to further subsidise any residential installation costs. The limited amount of money the City would be able to rebate would not seem worthwhile pursuing if it would do little in the way of encouraging residents to install the expensive technology.

Link to Strategic Plan:

Objective: To plan and manage our natural resources to ensure environmental sustainability.

Strategy: Further develop environmentally effective and energy-efficient programs.

Legislation – Statutory Provisions:

Not Applicable.

Risk Management considerations:

The advancement of solar technology is rapid. It would therefore be prudent for the City to further investigate new technologies before committing to solar power projects that may be quickly superseded.

Financial/Budget Implications:

Most of the funding available from government departments and agencies to purchase and install solar power systems target households, community buildings, off-grid areas (remote Australia), technology development, schools and State Government agencies.

The only current grant to have any applicability to the City is the Sustainable Energy Development Office (SEDO) Grants Program. If the City decided to implement a community-based project to “raise community awareness of ways to reduce energy use and increase the use of renewable energy”, then it may be eligible for a \$50,000 grant from SEDO. The only way to achieve eligibility would be to install community buildings (namely the City Library or Council Building) with solar energy systems that incorporate an education component accessible to all community members. The next funding round is likely to be in February 2008.

Installing the systems on the Administration building would not attract the grant as it is not a building considered accessible to the community. This is unfortunate in that the Administration building uses the greatest amount of energy out of all of the Council-owned buildings. If the City wished to go ahead with the installation of solar energy systems in the Administration building, it would most likely be at the City's cost.

Should the City wish to investigate the use of solar power technologies on its own buildings, a feasibility study will most likely be required, which will incur a significant cost to the City.

Policy implications:

Utilising solar energy systems at the City will further support the City's Sustainability Policy by achieving objective 5: "show leadership and community influence by demonstrating commitment and the benefits of improved sustainable practices".

Regional Significance:

Not Applicable.

Sustainability implications:

Should the City chose to employ solar energy systems, the result will be a significant reduction in greenhouse gas emissions which will contribute to an overall healthy environment.

Consultation:

Consultation with the Sustainable Energy Development Office was undertaken to determine the City's eligibility for grants and funding for the purchase and installation of photovoltaic modules on the City's buildings.

COMMENT

If the City were to install photovoltaic cells to its buildings at its own expense, connecting to the integrated power grid may offset the initial start-up costs, as the City would be saving in the long-term through heavily reduced non-renewable energy consumption. It is difficult to determine how long offsetting would take and as such, a consultant would be required to calculate the necessary cost benefits.

The City's Draft Greenhouse Action Plan identifies solar power lighting as a key area for investigation. The City has recently applied for a \$50,000 grant from the Australian Greenhouse Office to undertake a joint feasibility study with the City of Wanneroo for renewable energy lighting at key recreation areas around Lake Joondalup. The Joondalup Energy Team consisting of representatives from relevant business units across the City will facilitate the implementation of the Draft Greenhouse Action Plan and any investigations into renewable energy.

ATTACHMENTS

Attachment 1: Diagrams

VOTING REQUIREMENTS

Simple Majority.

RECOMMENDATION

That the Sustainability Advisory Committee **NOTES** the report and recommends that Council:

- 1 CONTINUES** to undertake its investigations into the potential for solar energy;
- 2 RAISES** awareness in the community by providing relevant information and encouragement for residents and businesses to consider installing solar systems in their homes and business premises.

ITEM 2 KEY PERFORMANCE INDICATORS FOR REDUCING THE CITY'S OIL CONSUMPTION [00906]

WARD: All

**RESPONSIBLE
DIRECTOR:** Mr Ian Cowie
Governance and Strategy

PURPOSE

To provide the Sustainability Advisory Committee (SAC) with information on potential key performance indicators for reducing the City's oil consumption; how these can be incorporated into the broader environmental reporting framework and a proposed approach for how on-ground action can be taken to reduce the City's oil consumption.

BACKGROUND

At its meeting on 19 July 2007, the Sustainability Advisory Committee requested that a report be drafted on the establishment of key performance indicators (KPIs) in relation to reducing the City's oil consumption.

This request was raised in response to a report on the Oil Depletion Protocol presented at the 19 July 2007 meeting. The Oil Depletion Protocol commits countries or organisations to reduce oil consumption by the world oil depletion rate. This equates to at least 3% per year.

DETAILS

The City is in the process of finalising and adopting two key environmental documents: the Draft Environment Plan 2007 – 2011 and the Draft Review Greenhouse Action Plan 2007 – 2010. The Environment Plan provides an overarching framework for the City's environmental strategies and actions to ensure environmentally sustainable management of its natural assets. The Greenhouse Action Plan provides specific direction for reducing the City's greenhouse gas emissions and includes actions relating to vehicles and transportation for both the corporate and community sectors.

The establishment of KPIs for the reduction of oil consumption will be included within the broader framework of establishing KPIs for the Environment Plan and the Greenhouse Action Plan. This will provide the basis of an annual State of the Environment Report for the City.

Issues and options considered:

Key Performance Indicators

The City reports progress annually on key performance indicators through its Strategic Plan Annual Performance Report. Each KPI is identified as an economic, environmental or social measure. KPIs in the 2005/06 report that relate specifically to the environment include:

- Level of community satisfaction with performance on conservation and environmental management;
- Level of community satisfaction with the City's food and pollution control services;
- Total tonnes of greenhouse gas emissions abated by Council programs and operations; and
- Total reduction of residential waste to landfill generated by the municipality.

These KPIs are broad, representing the broad objectives and strategies of the City's Strategic Plan. The reduction of the City's oil consumption, while not specifically identified, is a part of the total tonnes of greenhouse gas emissions abated. Note that the existing KPIs will be reviewed and a new set of KPIs will be developed inline with the new Strategic Plan.

Implementation and Reporting Framework

Once the Environment Plan and Greenhouse Action Plan are finalised and adopted an implementation and reporting framework will be developed. This will include setting timelines and priority for implementation; assigning responsibilities for actions; identifying key performance indicators and developing a reporting schedule to monitor implementation and performance.

The establishment of KPIs will be crucial to the effective implementation of these Plans. KPIs should be focused on measurable outcomes and not just outputs. KPIs will be identified for all the actions in the Environment Plan and Greenhouse Action Plan. In relation to the vehicle and transportation actions KPIs could include:

- Number of fleet vehicles;
- Size of vehicles (engine size);
- Kilometres travelled; and
- Consumption of different fuels (petrol, gas, diesel etc.)

The Implementation and Reporting Framework, in particular the KPIs, will provide the basis for an annual State of the Environment Report for the City. This State of the Environment Report will communicate to the wider community the progress made in the implementation of actions and improvements in the quality of the local environment.

Past and Current Transport Measures

The City, through the Cities for Climate Protection Program (CCP), has already undertaken a number of initiatives that relate to the reduction of oil consumption. These include:

- Adoption of the TravelSmart program to encourage increased use of public transport, walking and cycling;
- Active encouragement of sustainable transport options for the community, for example the introduction of the CAT bus for inner City travel;
- Purchase of two hybrid cars last year with a further two budgeted for purchase this year;
- Reduction in the size of the vehicle fleet;
- Reduced the size of the Executive fleet;
- Purchase of bicycles, which are available for staff to use to travel to and from inner City business meetings.

Transport related actions within the Draft Greenhouse Action Plan, which will be implemented over the next four years include:

- Action 15 Continue to introduce vehicles that emit less greenhouse gases when replacing stock.
- Action 16 Implement the City's Green Transport Plan in order to improve the City's car pooling system and provide staff with advice on greener driving.
- Action 28 Continue to pursue opportunities to increase parking and public transport options through negotiations with the State Government.
- Action 29 Undertake a review of the City of Joondalup Bike Plan.
- Action 30 Develop and implement a TravelSmart to Schools program.
- Action 31 Finalise the rollout of the Joondalup TravelSmart household program and seek further funding to continue the program.

CCP Sustainable Transport Project

Greenhouse gas emissions from transport can be a significant contributor to a local government's emissions profile for both the corporate and community sector. The International Council for Local Environmental Initiatives (ICLEI) under the framework of the Cities for Climate Protection (CCP) has developed the Sustainable Transport Project (STP) to assist Councils in addressing this challenging area.

The STP provides systems and tools that assist local governments to:

- Analyse and interpret a City's approach to sustainable transport against national best practice;
- Identify regional and local opportunities to support sustainable transport;
- Realise these opportunities through adjustments to policy and programs;
- Refine quantification methods and develop a business case for sustainable transport initiatives;
- Add to an information base of challenges and successful strategies; and
- Strengthen networks with other local governments and transport stakeholders.

The STP is an Advancing Action Project, which has been trialled for the past year with selected CCP Plus Councils in Queensland and New South Wales. The project is now being reviewed by ICLEI who is going to develop a range of tools and employ a fulltime project officer to support CCP Plus councils across Australia in the implementation of the STP. It is expected that participation in this project will become widely available in 2008 – 2009.

Participation in the Sustainable Transport Project will include the completion of five milestones, similar to that of the CCP program. Through this structure the City will: identify priority areas for improvement in relation to sustainable transport; establish priority actions within those areas; plan for their implementation and then implement and report on the actions.

Milestone 1	<i>Gap Analysis</i> – Assess existing actions and highlight opportunities and areas for improvement
Milestone 2	<i>Set Goals</i> – Identify priority goals based on the outcomes of the gap analysis
Milestone 3	<i>Sustainable Transport Action Plan</i> – development of an action plan based on outcomes of milestone 1 & 2
Milestone 4	<i>Implementation</i> – implement actions identified in the plan
Milestone 5	<i>Review the plan</i> – re-strategise if necessary

Key outcomes from participating in the Sustainable Transport Plan will be:

- 1 A review and analysis of the City's performance across nine components: policy, organisational issues, plans and strategies, parking scheme/strategy, traffic calming, cycling and walking, public transport, mobility management, and council operations.
- 2 A Sustainable Transport Action Plan that provides prioritised actions for the improvement of sustainable transport options for both the corporate and community sectors.

Link to Strategic Plan:

Outcome: The City of Joondalup is environmentally responsible in its activities.

Objective: 2.1 To plan and manage our natural resources to ensure environmental sustainability.

Strategies: 3.1.2 Further develop environmentally effective energy-efficient programs.

Legislation – Statutory Provisions:

Not Applicable.

Risk Management considerations:

The risks associated with the introduction of key performance indicators include a lack of resources for the corresponding monitoring procedures to be put in place.

Financial/Budget Implications:

There will be administrative costs associated with the monitoring of key performance indicators.

Policy implications:

Not Applicable.

Regional Significance:

Not Applicable.

Sustainability implications:

The development of effective KPIs and associated monitoring, will improve our management and consumption of finite resources.

Consultation:

Not Applicable.

COMMENT

Actions for reducing oil consumption are currently incorporated into the City's Draft Environment Plan and Greenhouse Action Plan. KPIs for reducing oil consumption should be developed within the framework of KPI reporting for the Environment Plan and Greenhouse Action Plan. The KPIs for these Plans will then form the basis of an annual State of the Environment Report for the City.

Participation in the Sustainable Transport Project will strengthen and broaden the City's actions in relation to transport, including reduction of oil consumption. The STP utilises a well-tested milestone framework and provides essential support to local governments including templates, case studies, and other resources and importantly can assist with monitoring and quantification. This kind of support is not available with the Oil Depletion Protocol. Also remaining within the CCP framework will avoid the duplication of actions or additional reporting requirements.

ATTACHMENTS

Nil.

VOTING REQUIREMENTS

Simple Majority.

RECOMMENDATION

That the Sustainability Advisory Committee NOTES the report and recommends that Council:

- 1 INCORPORATES Key Performance Indicators for the City's oil consumption into the Implementation and Reporting Framework for the Environment Plan 2007 - 2011 and Greenhouse Action Plan 2007 – 2010;**
- 2 CONSIDERS participating in the Cities for Climate Protection Sustainable Transport Project in 2008-09, if available.**

ITEM 3 FUTURE SUSTAINABILITY ADVISORY COMMITTEE STRUCTURE [00906]

WARD: All

**RESPONSIBLE
DIRECTOR:** Mr Ian Cowie
Governance and Strategy

PURPOSE / EXECUTIVE SUMMARY

To provide the Sustainability Advisory Committee (SAC) with information on the merit of the City establishing a Sustainability Forum system, to enable sustainability issues to be workshopped with concerned residents.

BACKGROUND

A Review of Advisory Committees report was presented at the 10 October 2006 Council meeting (Attachment 1 refers). It was resolved that Council:

- 1 *ACCEPTS that the operating arrangements for Conservation Advisory Committee, Sustainability Advisory Committee and Seniors' Interest Advisory Committee be reviewed to achieve greater community engagement and the provision of the most comprehensive and highest quality advice to Council;*
- 2 *CONSIDERS this matter further at a Strategy Session with a follow up Report to be provided to Council;*
- 3 *SUPPORTS the development of a training package to be provided to new Committee members;*
- 4 *REFERS Report CJ174-10/06 to the Committees for their information and comment.*

The report was considered by SAC at its 8 February 2007 meeting (Attachment 2 refers). The SAC resolved that:

- 1 *The Sustainability Advisory Committee NOTES Council Report CJ174-10/06 Review Of Advisory Committees of the Council;*
- 2 *The Sustainability Advisory Committee advises Council that it wishes to retain its current committee format, with a reduction of members to 11, until the October 2007 local government elections;*
- 3 *The Sustainability Advisory Committee reconsiders different committee structure models at its last meeting prior to the October 2007 local government elections.*

In addition, SAC requested a report on the merit of the City establishing a Sustainability Forum system, to enable major sustainability issues to be workshopped with concerned residents.

DETAILS

To improve the effectiveness of the City's consultation process on sustainability issues and to build the capacity of the community to participate in sustainability issues, the establishment of Sustainability Forums is proposed.

The Sustainability Forums would be similar to the format used by the City for its business forums, which were established as a mechanism to raise awareness of the City's role in economic development for Joondalup. Three successful forums were held in 2006/07, with 88, 120 and 178 businesses and stakeholders attending the forums. (Note: the last forum was jointly held with City of Wanneroo). A further three forums are proposed for 2007/08 with improved opportunities for interaction and two-way communication within the forums.

The benefits and disadvantages of establishing the Sustainability Forums are considered below. To provide a clearer idea of how the Sustainability Forums may operate, an outline of a hypothetical Sustainability Forum is attached (Attachment 3 refers).

Benefits

- Potential to reach a larger percentage of the community;
- Potential to reach a broader cross-section of the community;
- Is a mechanism to inform the community about sustainability issues and the City's sustainability initiatives;
- Can include high-profile guest speakers to increase participation rates;
- Forums will enable a two-way conversation between the City and the community;
- Provides opportunity for the community to participate in the City's consultation processes in a meaningful way;
- Will build the capacity of the community to participate in sustainability issues and empower them so that they can make a difference;
- Is a mechanism for gauging the knowledge, attitudes and needs of the broader community in relation to sustainability;
- Will provide information that is invaluable for ensuring the City's sustainability initiatives are relevant and meet the needs of the broader community;
- Can be used to generate ideas for new initiatives and projects; and
- Can be used to develop a network of concerned citizens that can be informed on an ongoing basis through a newsletter or email about the City's sustainability initiatives.

Disadvantages

- Will require greater resources; and
- Will meet less often than SAC does presently.

Issues and options considered:

Four potential structures for the consultation of sustainability issues have been considered:

Option 1 Sustainability Forums only

Sustainability Forums would be held on a regular basis, possibly three times per year (with meetings set following finalisation of a suitable agenda) to workshop sustainability issues with concerned residents. The Sustainability Forums would supersede SAC and SAC would cease to operate.

Option 2 Sustainability Forums and items referred to SAC as needed

Sustainability Forums would be held as in option 1 to workshop sustainability issues with concerned residents. SAC would continue to operate on an as needed basis. Specifically SAC would meet only when Council refers items to SAC for their consideration.

Option 3 Sustainability Advisory Committee only

The structure and terms of reference of the SAC would remain the same, with the SAC meeting on a regular basis (Attachment 4 refers). However, there would be no sustainability forums.

Option 4 Sustainability Forums and SAC

Sustainability Forums would be held as in option 1 to workshop sustainability issues with concerned residents and the structure and terms of reference of the SAC would remain the same, with the SAC meeting on a regular basis. This option, in particular, would require the endorsement of Council as it would involve additional resources.

Link to Strategic Plan:

Outcome: The City of Joondalup is environmentally responsible in its activities.

Objective 2.1: To plan and manage our natural resources to ensure environmental sustainability.

Legislation – Statutory Provisions:

Not applicable.

Risk Management Considerations:

The City does not have the resources to manage both Sustainability Forums and the SAC under its current structure.

Financial/Budget Implications:

There will be administrative costs associated with coordination of Sustainability Forums. Administrative costs are currently associated with the coordination of the SAC.

Policy Implications:

Not applicable

Regional Significance:

Not applicable

Sustainability Implications:

Sustainability issues are at the forefront for the City and it is considered appropriate that the greatest base for community consultation for these issues be achieved.

Consultation:

Not applicable

COMMENT

It is considered that the establishment of Sustainability Forums would enable the City to undertake more effective and participatory consultation on issues of importance. Importantly it will also build the capacity of the community to participate in sustainability issues.

The Sustainability Forums offers significant benefits for both the City and the community with the ultimate outcome that the City can ensure future environmental actions and initiatives are aligned with community needs and wants.

The City participates in the International Council for Local Environmental Initiatives (ICLEI) Cities for Climate Protection (CCP) Program and Water Campaign. Both these programs have a large community component including setting reduction targets for the community sector and identifying actions and strategies to help the community to reduce their consumption. To date the City's effectiveness in engaging the community in these programs has been somewhat limited. The Sustainability Forums will enable more effective community engagement, improving the implementation of these programs.

ATTACHMENTS

Attachment 1	Review of Advisory Committees of Council
Attachment 2	Response to Review of Advisory Committees of Council
Attachment 3	Outline for a theoretical Sustainability Forum
Attachment 4	Possible Future Meeting Dates of the SAC

VOTING REQUIREMENTS

Simple Majority

RECOMMENDATION

That the Sustainability Advisory Committee NOTES the report and RECOMMENDS to Council that in future Council focus on holding Sustainability Forums for the broader community to workshop sustainability issues with concerned residents (as outlined in option 1).

ITEM 4 THERMAL WEED CONTROL

WARD: All

**RESPONSIBLE
DIRECTOR:** Mr Ian Cowie
Governance And Strategy

PURPOSE/EXECUTIVE SUMMARY

To present the report on Thermal Weed Control to the Sustainability Advisory Committee for comment.

BACKGROUND

At its meeting on 28 August 2007, Council resolved (*CJ170-08/07 refers*), inter alia, to:

“Refers the report on Thermal Weed Control in the City of Joondalup to the Conservation Advisory Committee and the Sustainability Advisory Committee for comment”

This report seeks to address the request outlined in the abovementioned recommendation.

The consideration of thermal weed control arose from a 137-signature petition which was presented to Council in May requesting the use of hydrothermal weed control technology instead of chemical spraying wherever possible and requesting a report being presented to Council on this matter.

It should be noted that Local Governments have the responsibility to control weed growth on land they manage. In some cases this extends to the control of noxious weeds which are required to be controlled by law. These requirements form part of the operational maintenance tasks associated with road and land management. The City of Joondalup currently controls weed growth in a range of locations including pathways, road verges/medians, public gardens, grassed parkland and bushland. Weeds in the main are controlled using a range of chemical based herbicides with a lesser amount being removed by hand or mechanical methods. This work is undertaken using Council work teams, contractors, and in natural areas volunteers assist the City with this work.

DETAILS

The City commissioned a report to be written by John Banks (Arboriculturist) and Graeme Sandral (Agronomist).

The brief for the compilation of the report sought the following analyses:

- Compare the cost of herbicide based weed control and thermal based weed control;
- Examine the advantages and disadvantages of both methods;

- Identify the most suitable circumstances for the use of these technologies.

The following is a summary of the main findings contained within the report which is found at Attachment 1:

“As a generalisation, herbicides are more cost effective and its use achieves better kill rates than thermal weed control methods. The cost advantages and speed of application associated with herbicides indicate that they are suitable for large-scale operations;

Thermal weed control methods are best utilised where environmental or health issues are significant and where off site damage to non-target plants is a high risk. The costs and speed at which thermal weed control can be undertaken may limit its scale of operation. Weed control efficiency is improved if the frequency of thermal weed control is no longer than six weeks apart and, where there is an occurrence of perennial weeds which are hard to kill, hand weeding or herbicide spot spraying may be necessary on second cycle treatments.”

Issues and options considered:

The City has a number of options it may choose to take:

- 1 Undertake all weed control using chemical and mechanical methods (hand weeding).
- 2 Use a combination of chemical, thermal weed and mechanical control. Using each technology where appropriate.
- 3 Use thermal and mechanical weed control methods only.

Link to Strategic Plan:

Key Focus Area

Caring for the environment.

Outcomes

The City is environmentally responsible in its activities.

Legislation – Statutory Provisions:

Control of declared noxious weeds – Division 3, Section 42 – Agriculture and Related Resources Protection Act 1976.

Risk Management considerations:

Not applicable

Financial/Budget Implications:

The report outcomes indicate that the cost of thermal weed control relative to traditional herbicide methods is up to 2 times more expensive per treatment, and the kill rate on some perennial weeds will be lower. When translating this into yearly weed control the thermal treatment will require 1.5 to 2 times more applications as compared with herbicide control. Therefore, on a yearly basis the additional cost of the thermal weed control treatment may be up to 3 to 4 times more expensive than herbicide application. This is due to the higher cost per application and the higher number of applications required to achieve the same results. The City's expenditure for weed control for the last 3 contractual periods is on average \$460,000 per annum for weed control external to natural areas.

Policy implications:

Not applicable

Regional Significance:

Not applicable

Sustainability implications:

Not applicable

Consultation

Council is seeking input on the consultant's report from relevant advisory committees.

COMMENT

Not applicable.

ATTACHMENTS

Attachment 1	Report on Weed Control Using Hot Water / Steam and Herbicides in the City of Joondalup
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VOTING REQUIREMENTS

Simple Majority.

RECOMMENDATION

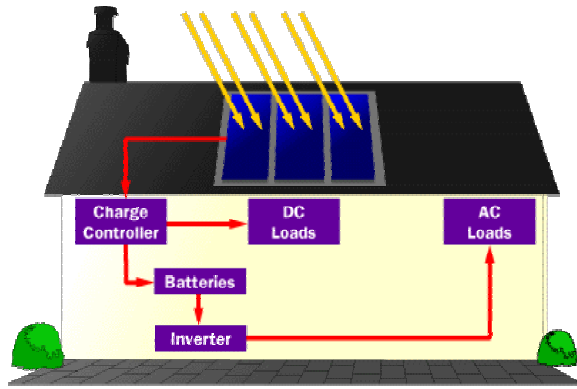
That the Sustainability Advisory Committee NOTES the report on Thermal Weed Control shown as Attachment 1 and provides comment to Council on the report.

**APPENDICES FOR AGENDA OF
SUSTAINABILITY ADVISORY COMMITTEE**

ITEM	TITLE	APPENDIX	PAGE
Item 1	Solar Power Technology - Diagrams	1	
Item 5	Future Sustainability Advisory Committee Structure: Attachment 1 Review of Advisory Committees of Council Attachment 2 Response to Review of Advisory Committees of Council Attachment 3 Outline for a theoretical Sustainability Forum Attachment 4 Possible Future Meeting Dates of the Sustainability Advisory Committee	2	
Item 6	Thermal Weed Control – Report on weed control using hot water/steam and herbicides in the City of Joondalup	3	

Attachment 1 – Diagrams.

Diagram: 1



Flat-plate collectors, (photovoltaic cells) used for the production of electricity.

Diagram: 4



Solar water heater

Diagram: 2



Odeillo-Font-Romeau Solar Furnace in France

Diagram: 5

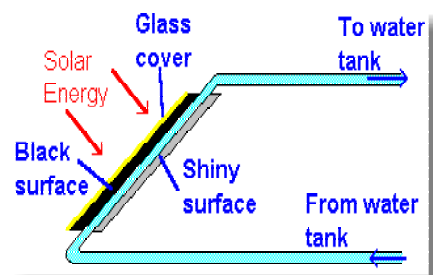


Diagram of solar water heater

Diagram: 3

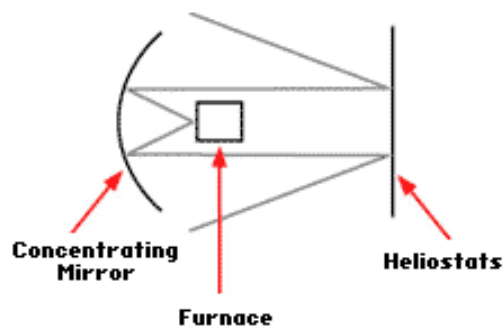


Diagram of a Solar Furnace

CJ174-10/06

**REVIEW OF ADVISORY COMMITTEES OF
COUNCIL – [15058]****WARD:** All**RESPONSIBLE
DIRECTOR:** Mr Ian Cowie
Governance and Strategy**PURPOSE**

To present options to Council for the future operation of Advisory Committees.

EXECUTIVE SUMMARY

This report identifies four options in relation to the operation of Advisory Committees. These are:

- Tailoring approaches to meet different objectives;
- Establishing a different Advisory Committee structure format;
- Induction and training for Advisory Committee members; and
- Developing a protocol for referrals between Council and its Advisory Committees.

It is recommended that Council reviews operating arrangements for the Sustainability Advisory Committee, the Conservation Advisory Committee and the Seniors' Interest Advisory Committee to maximise community engagement and ensure Council receives the highest possible quality of advice. It is also recommended that a training package be developed for Advisory Committee members.

BACKGROUND

Council currently operates with three Advisory Committees which contain both Council members and members of the public. These are the:

- Sustainability Advisory Committee (SAC) - established to provide advice on actions to promote sustainability.
- Conservation Advisory Committee (CAC) – established to provide advice on the conservation and management of the City's natural biodiversity.
- Seniors' Interest Advisory Committee (SIAC) – established to ensure the concerns of seniors are relayed to the City.

The current membership and full terms of reference for each of these Advisory Committees are provided in Attachment 1. None of these Committees has been delegated powers by Council and so they operate on an advisory basis. Under the Local Government Act 1995, Committees which do not have delegated powers do not have to open their meetings to the public.

The last significant review of Council Committees occurred in February 2004. This review examined the roles and membership of all Committees and led to 11 Committees being disbanded.

In accordance with the Act, the current Council appointed members to the three Advisory Committees in May 2006. However, after almost 5 months of operation, it is now considered timely to review the focus of the SAC and CAC in particular. This is because:

- There can be a tendency for these Committees to take an operational rather than a strategic advisory focus;

- The Committees consume considerable staff time and resources in terms of the preparation of reports and meeting administration (including the setting of agendas and taking of minutes);
- It is beneficial to consider whether current Committee members represent the most comprehensive source of expertise on the relevant subject matters; and
- There are questions over whether the Committee structure provides the most appropriate mechanism for community engagement.

DETAILS

Issues and options considered:

Four potential options are identified to assist the operation of the Advisory Committees and, in particular, the CAC and SAC. Some of these options may be appropriate for all 3 Committees while others will be more relevant to the CAC and SAC.

1 Tailoring Approaches to Meet Different Objectives:

It appears that, at present, some Advisory Committees are trying to achieve two objectives. The first is community engagement while the second is obtaining the most comprehensive and best possible advice for the Council. Both of these objectives are valid and important. However, rarely can different objectives be achieved to their greatest extent possible by using just one vehicle. This is because, to achieve greatest success, the vehicle for achievement needs to be designed specifically for the job.

Considering the SAC and the CAC in this way, the following observations can be made. In terms of their operations, the CAC and the SAC follow Council's Standing Orders and consider formal reports. This process reflects provisions within the Local Government Act. However, this structure is not necessarily the best vehicle for community engagement as the formalised approach gives:

- Limited opportunity for general discussion and debate;
- It constrains networking due to the nature of the agenda;
- It precludes other community members with interests from being directly engaged unless they can become a member; and
- It does not encourage learning and the growth of knowledge through open discussion with eminent guest speakers.

In terms of membership, SAC members are nominated by members of the Committee with no maximum number of members specified. CAC members are community representatives with specialised knowledge or representatives of community groups protecting local bushland and the like. Again, no maximum numbers are specified. These are not necessarily the best mechanisms for obtaining the most comprehensive and best possible advice. Further, they do not align to the City's Public Participation Strategy which values broad inclusiveness. As the Committees rely on the willingness of local people to become involved, the approach does not necessarily engage experts from government agencies and the like operating outside of the City which weakens the advisory potential.

There are a range of ways in which the Advisory Committees could increase community engagement and take on a more professional advisory focus. A community engagement focus could be maximised by having forums and workshops with all interested community members. This involvement could be facilitated by advertising meetings to the whole community. Offering public meetings where specialist speakers make presentations could also be used to raise community knowledge and understanding. This is more clearly aligned to the Public Participation Strategy.

From the perspective of comprehensive and high level Council advice, optimum achievement could be facilitated by establishing Committees with:

- A small number of Elected Members;
- A small number of community members from the City of Joondalup selected on the basis of their expertise and ability to provide quality advice; and
- A small number of technical experts identified and selected specifically from academia, relevant government agencies or other appropriate bodies. This could include recently retired people with the requisite knowledge or people operating a consultancy in a relevant area. They would not necessarily be residents of Joondalup.

Should the suggestion be accepted that the Council seek to achieve maximum community engagement on relevant issues and to receive the most comprehensive and highest quality advice, a number of opportunities for progress are possible. One could be to establish a technical and specialist advisory committee which operates independently from the community engagement process. From a CAC perspective, this could involve the establishment of a Friends' Forum, for instance. The other is for integration of the advisory and engagement roles and this could occur in a range of ways. One option could be for a new specialist committee to hold formal meetings during one month to consider issues and provide advice to Council. Then during the next month, the Committee would participate in much broader community engagement outside of the formal meeting procedure arrangement and the Local Government Act requirements.

2 Establish a Different Committee Structure:

The City's Advisory Committees currently cover a limited number of areas. However, the broad focus of the SAC which considers the integration of economic, social and environmental matters, ensures that the Advisory Committee structure can consider a very broad range of matters. This said, the broad nature of the sustainability concept,

which is in no way refined and narrowed by the SAC's Terms of Reference, may well mean that the SAC has interests in areas which are covered by other Committees. Consequently, a different model may provide advantages. However, this option would require a significant change to the current Advisory Committee arrangements and, consequently, is not supported unless other options to enhance operations are trialled and fail.

3 Induction and Training:

Whilst the Council members who sit on Advisory Committees will have experience in Council processes and the decision making role, many community members on these Committees will have had little exposure to such processes. All Committee members need to have a clear understanding of the decision making process and the role of the Committee within that process. To achieve this, it would be prudent for the City to develop an induction and training program for newly-elected Committee members which includes information about:

- The major function of the Committee;
- Its role in the Council decision making process; and
- A member's role and responsibilities on the Committee.

This option is relevant to all Advisory Committees.

4 A Protocol for Referrals:

A specific protocol could assist the operation of Advisory Committees in terms of their relationships with Council. The protocol could cover matters such as:

- How items are included on the agenda of Advisory Committees;
- What items and matters may be discussed at meetings;
- The operation of Standing Orders in relation to Committee deliberations; and
- The provision of Officer support.

This option is relevant to all Advisory Committees. However, it is not supported as it does not offer any fundamental change to arrangements and protocols can be overlooked.

Link to Strategic Plan:

Outcome: The City of Joondalup is an interactive community.
Objective: 4.3: To ensure the City responds to and communicates with the community.
Strategies: 4.3.2: Provide fair and transparent decision making processes.

Legislation – Statutory Provisions:

The Advisory Committees have been established in accordance with provisions of the Local Government Act 1995 relating to Committees.

Risk Management considerations:

Concerns could be expressed that Council is considering changing community engagement and may weaken the engagement. However, regular reviews of Advisory Committee operations and careful analysis of the best way in which to achieve both community engagement and high level advice will ensure that Council needs in relation to advice are being met and community engagement remains effective.

Financial/Budget Implications:

While there are no specific budget line items affected by this report, staffing commitments are influenced by the way Advisory Committees operate.

Policy implications:

Not applicable.

Regional Significance:

Not applicable.

Sustainability implications:

Consideration of the operations of the SAC will ensure the Council receives the most appropriate advice in this area.

Consultation:

The report considers the most appropriate ways for the Council to engage with and consult the community.

COMMENT

Advisory Committees complement the formal and central decision making processes by allowing community and expert input into decisions of Council. However, it is noted that when Committees attempt to achieve two different outcomes (one being community engagement and the other being expert advice) difficulty can be experienced in achieving either outcome to the highest level. Based on this conclusion, it would seem appropriate that Council give further consideration to the best way of achieving community engagement, and the receipt of high quality advice. It would also appear appropriate that training be provided for all Committee members.

ATTACHMENTS

Attachment 1	Members and Terms of Reference for Sustainability Advisory Committee, Conservation Advisory Committee and Seniors' Interest Advisory Committee.
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VOTING REQUIREMENTS

Simple majority.

MOVED Mayor Pickard, SECONDED Cr Jacob that Council:

- 1 **ACCEPTS** that the operating arrangements for Conservation Advisory Committee, Sustainability Advisory Committee and Seniors' Interest Advisory Committee be reviewed to achieve greater community engagement and the provision of the most comprehensive and highest quality advice to Council;

- 2 **CONSIDERS** this matter further at a Strategy Session with a follow up Report to be provided to Council;
- 3 **SUPPORTS** the development of a training package to be provided to new Committee members.

AMENDMENT MOVED Cr Magyar, **SECONDED** Cr Park that an additional Point 4 be added to the Motion as follows:

- "4 **REFERS** Report CJ174-10/06 to the Committees for their information and comment."

Discussion ensued.

The Amendment was Put and

CARRIED (12/0)

In favour of the Amendment: Mayor Pickard, Crs Amphlett, Corr, Currie, Evans, Fishwick, Hollywood, Jacob, John, Magyar, McLean and Park

The Original Motion as amended, being:

That Council:

- 1 **ACCEPTS** that the operating arrangements for Conservation Advisory Committee, Sustainability Advisory Committee and Seniors' Interest Advisory Committee be reviewed to achieve greater community engagement and the provision of the most comprehensive and highest quality advice to Council;
- 2 **CONSIDERS** this matter further at a Strategy Session with a follow up Report to be provided to Council;
- 3 **SUPPORTS** the development of a training package to be provided to new Committee members;
- 4 **REFERS** Report CJ174-10/06 to the Committees for their information and comment.

was Put and

CARRIED (12/0)

In favour of the Motion: Mayor Pickard, Crs Amphlett, Corr, Currie, Evans, Fishwick, Hollywood, Jacob, John, Magyar, McLean and Park

Appendix 10 refers

To access this attachment on electronic document, click here: [Attach10agn101006.pdf](#)

Theoretical Sustainability Forum**ATTACHMENT****A Sustainable Water Future for Joondalup**

3

Proposed Date: Wednesday 16 January**Time:** 6.30pm – 8.30pm**Location:** Joondalup Reception Centre**Partners:** Water Corporation**Purpose:**

1. To provide the community with up to date information on current water issues and on actions they can take to reduce water consumption.
2. To raise awareness of the City's participation in the ICLEI Water Campaign.
3. To gain input and ideas from the community on initiatives, strategies and directions for inclusion in the City's Water Action Plan.

Format: Presentations followed by a structured workshop

1. Keynote presentation from guest speaker (30 mins, 15 mins questions)
2. Presentation from the City on its participation in the Water Campaign (10 mins)

Break for refreshments (20 mins)

3. Structured workshop on what action the community wants the City to take in relation to water and what assistance they need to reduce their water consumption (40 mins).

Budget: Keynote presenter may incur a cost depending on the speaker.

Workshop facilitator

Marketing

Refreshments

Sustainability Advisory Committee

Proposed future meeting dates

Thursday evenings 6:00pm

ATTACHMENT

- - - 4 - -

Meeting on an 8 week basis
(allowing for Council break during December/January 2007)

- 8 November 2007
- 21 February 2008
- 17 April 2008
- 12 June 2008
- 7 August 2008

APPENDIX

3 - -

ATTACHMENT 1

REPORT ON WEED CONTROL USING HOT WATER / STEAM AND HERBICIDES IN THE CITY OF JOONDALUP



PREPARED FOR THE CITY OF JOONDALUP
BY JOHN BANKS AND GRAEME SANDRAL

SUBMITTED
19 July 2007

Background:

Weeds are a chronic problem that cost various industries millions of dollars every year. Often the most economical means of controlling weeds in these industries is via the application of herbicides.

Local Councils also experience significant cost when controlling weeds however the considerations Councils have to give when selecting a weed control method often involves a larger range of issues compared to weed control in other industries.

This report therefore will compare thermal weed control methods and the herbicide use for various urban purposes with the Joondalup City Council.

Consultants Brief:

Compare the cost of herbicide based weed control and thermal based weed control.

Examine the advantages and disadvantages of both methods.

Identify the most suitable circumstances for use of these technologies.

Methodology:

Study 1 - Thermal weed control

Study 2 - Thermal weed control - hot water and steam combination

Study 3 - An examination of weed control using herbicides

Study 4 - Weed control using the herbicides Amitrole and Glyphosate

Study 5 - Risk management with herbicides

Study 1 - Thermal weed control

There are primarily four types of thermal weed control. These include flame or fire, hot water, steam, and steam and hot water combination.

Flame methods are not considered in this study as they provide an unacceptable fire risk in Australian conditions and are considered unsuitable for urban situations. Each of the other methods has been investigated below.

In comparing the three remaining methods (hot water, steam, and steam and hot water combination) some important criteria have received more emphasis. The first was the temperature achieved at the nozzle tip. This is important as the time taken to kill a weed and overall kill rate of these methods depends on the temperature being delivered at the nozzle tip. The second consideration was the amount of water used, as water use needs to be efficient in our water limiting environment. Furthermore high water use results in more down time refilling.

Thermal weed control - Hot water

The hot water method uses unacceptable amounts of water (greater than 600 liters per hour). It delivers temperatures in the low 90 degrees Celsius range and holds these temperatures for an acceptable period of time or at least longer than steam methods. While temperature loss is not excessive past the nozzle tip the initial delivery temperature is low and requires slower operational speeds to ensure weed kill is effective. Temperature impact 1 cm below ground is considered very effective and is important when looking to kill plant cells in the base of the plant which is necessary for the control of perennial weeds.

Thermal weed control - Steam

The steam method is much more water efficient and delivers temperatures that are initially higher than that of the hot water method however the steam method experiences rapid cooling which reduces its effectiveness in controlling weeds. The impact of cooling is reduced to some degree, but not completely, by the use of a hood at the end of the application nozzle. The steam however has poor ground penetration which results in slower operational speeds and poor control of perennial species.

Thermal weed control - Hot water and Steam combination

The hot water plus steam combination does in effect combine the attributes of the previous two methods. It has acceptable water use (250 to 350 liters per hour), with water heated under pressure to 130 to 140 degrees Celsius and delivered at the nozzle at around 97 degrees Celsius. This temperature ensures acceptable operational speeds can be achieved as well as effective weed control. Heat penetration into the soil surface is also adequate for weed control purposes.

Conclusion:

In summary it was concluded that the combination of steam and hot water is most effective at controlling weeds and has acceptable water use rates.

Study 2 - Thermal weed control - hot water and steam combination.

Pros: Hot water and steam is very effective at killing annuals, some perennials and some permeable seed near the soil surface. There is virtually a zero risk of non-target plant damage (except when applied on lawn or oval situations) and it is generally more benign to the environment than alternative herbicide options, although it does use more water.

Because its operation is more labour intensive and output is often restricted to one nozzle, the areas (scale) targeted for this method of weed control should be focused on those where weeds are confined to stripes or small patches. For example this method would be more suitable for smaller scale operations targeted at weeds in pathways and roadside cracks, garden beds and around the base of established trees. Areas considered less suitable would include larger scale operations in sumps or extensive roadside and pathways weed control programs. Thermal weed control (hot water and steam combination) would also be more suitable for use in areas where residences are known to have health risks, in areas that have significant environmental value, or in areas with a high concentration of human activity such as City Centers.

Cons: The hot water and steam combination, like the other thermal weed control methods, is effectively a contact, non-systemic means of controlling weeds. Hence, if part of the weed is not treated there is a risk that the whole plant will survive. Furthermore, non-systemic means of weed control are less effective against some perennials. This is

because many perennials store carbohydrate reserves in their crown and root system. When new growth is needed the stored carbohydrate is mobilized by the plant to develop new growth. These parts of the plant (crown and upper root system) are often protected by woody tissue or are imbedded under the soil surface and, therefore, are protected from the effects of the treatment.

Research - 1: The following research was conducted on white and red clover by Acacia Smith, Leslie Phillips-Catton and Jennifer Symms in the US. Results are summarized and conclude that overall hot water/steam initially decreases the presence of weeds. However, this decrease only lasts about 4-6 weeks until the species start recovering. More specifically hot water/steam decreased the presence of White Clover (*Trifolium repens*) but did not decrease the presence of Red Clover (*Trifolium pretense*). It was proposed in this research that more frequent treatment with hot water/steam, would improve results.

Research - 2: This research was undertaken in the US by a City Council. In summary they found that hot water/steam controlled annual weeds by burning plant cells; however the method was ineffective against many perennials. They found the method was unsuitable for parks, lawns and ovals and that the method was slow and labour intensive. To be effective the hot water/steam method required repeated treatment applications through the growing season.

Research - 3: The research outlined below was conducted at Colorado State University Cooperative Extension Agent (Agriculture) in Adams County. Hot water/steam applications to horticultural crop rows provided excellent weed control on small annual weeds and good to fair activity on deep rooted perennial weeds. To ensure season long management of weeds multiple applications were necessary. The most cost effective water rate found was 250 liters per hour.

Research - 4: Research over four years conducted by Virbickaite *et al* at the Lithuanian University of Agriculture found thermal weed control on annuals weeds was 22% more effective than mechanical (cultivation) weed control, however mechanical weed control was 32% more effective against perennial weeds.

Interviews: Several interviews were conducted with operational staff and owners of hot water/steam weed control systems in Perth and Sydney. In summary they agreed that this method was most effective on annual weeds and operations were fastest when weeds

were small and density was low. They indicated that some perennial weeds such as couch (*Cynodon dactylon*) were not controlled very effectively by this method. Initially couch would brown off however some weeks later it would re-grow. Operational staff indicated that maintaining very high temperatures at the nozzle was extremely important for good weed kill and reasonable speed of operation. They also indicated that operator experience was essential as some weeds required longer treatment time than others to ensure effective control.

Costs: Cost in Australia range from \$80 to \$350 per km of pathway and roadside curb combination. The large variation in price is made up of a range in labour cost from \$80 to \$100 per hour for two people and a work rate range of 1 to 0.35 km per hour. The work rate is the most variable component and depends on the density of weeds and the type of weeds present. The most common price range was between \$165 and \$220 per km for paths and roadside curbing.

Conclusion: Hot water/steam is most effective on young annual weeds and least effective on older perennial weeds. In some cases control of perennial weeds will be ineffective however this depends on the weed species present and its age. Thermal weed control (hot water and steam combination) is best utilized in situations where conservation or health considerations are high and weed density is low. In addition, best results are obtained when follow up weed control is undertaken 4 to 6 weeks after the initial treatment. To control weeds over a period of a year it is likely that between 3 and 5 applications will be necessary, depending on rainfall and the extent of the weed seed bank.

Study 3 - An examination of weed control using herbicides.

Comparable herbicides to thermal weed control methods are those known as knockdown herbicides. These are non selective and will kill all plants they are applied to. Within this group there are three classes of herbicides and these include contact non-persistent herbicides such as Paraquat and Diquat available in the product Sprayseed; translocated non-persistent herbicides such as Glyphosate available as Roundup and translocated persistent herbicides such as Amitrole, available in various product names.

Sprayseed (contact herbicide with no residual effects):

Sprayseed is not considered as a viable alternative in urban areas due to its S7 poisons schedule rating and ineffectiveness on many perennials.

Glyphosate (systemic herbicide with no residual effects):

Glyphosate is one of the few products registered for weed control in water catchments. It requires very low volumes of water and is effective against annual and perennial weeds. It will not however kill weeds germinating after its application. Its non-residual nature means any glyphosate movement off-site will not impact on non-target plants.

Glyphosate is not a dangerous good according to the dangerous goods code and its poisons schedule classification is S5.

Amitrole (systemic herbicide with residual effects):

Amitrole is also registered for use in water catchments. It requires similar water volumes to Glyphosate, is effective against annual and perennial weeds, and has some residual weed control properties. These residual properties can reduce the need for follow up weed control and in these circumstances are more cost effective. Conversely any off-site movement of amitrole may impact on non-target plants. As an example amitrole sprayed over weeds in pathway cracks will result in some of the herbicide landing on the pathway which could be washed by rainfall or sprinklers into lawn edges or garden beds where Amitrole could impact on non-target plants.

Amitrole like glyphosate is not a dangerous good and has a S5 poisons schedule classification.

Conclusion:

Glyphosate and amitrole are the preferred knockdown herbicides. Glyphosate is acceptable for use in areas where runoff may occur onto other areas containing vegetation, while amitrole, or mixtures of these herbicides is acceptable for use in areas that do not have runoff onto nearby areas containing vegetation. To control weeds over a year using these products 2 to 3 applications would be required.

Study 4 - Weed control using the herbicides Amitrole and Glyphosate.

Pros: Amitrole and glyphosate are effective at killing both annual and perennial weeds with some residual weed control evident when amitrole is applied. The systemic nature of these herbicides ensures effective control of perennials and if part of the weed is sprayed, the herbicide is translocated throughout the plant to cause death.

Herbicide application is not labour intensive and suitable to a wide range of situations including ovals, parks, lawns, pathways and roadways (except amitrole on pathways due to possible run-off and off site affects). Glyphosate can also be used by trained personnel under controlled conditions in areas that have significant environmental value.

Cons: There is a risk of non-target plant damage via spray drift (and over spray) for Glyphosate or spray drift (and over spray) and run-off for amitrole. The occurrence of this is considered a low risk however it is dependant on spray pressures, wind speed, operator care and skill level. While the systemic nature of these herbicides is a plus for killing target weeds it is also a negative when spray drift or overspray occurs onto non-target plants.

These products should be avoided where possible in areas where residences have known health risks.

Costs: Costs in Australia range from \$90 to \$130 per km of pathway and roadside curb combination. The variation in price is small and is attributed to a highly developed and competitive industry. A breakdown of pricing indicates \$25 to \$40 is charged for road side curbs and from \$65 to \$90 per km for foot paths.

Conclusion: Amitrole and glyphosate are a cost effective means of weed control and provide reliable kill rates on target weeds. The speed of operation provides significant advantages when large scale operations are to be undertaken. Both herbicides however should be restricted where residential health sensitivities are known.

Study 5 - Risk management with herbicides:

There are several steps that can be taken to reduce potential problems with the application of herbicides. These include;

1) Selecting herbicide products with a broad range of label use specifications. For example glyphosate can be purchased under many different product names and not all products allow for general garden use, use in aquatic areas, use on unwanted trees or use in bush-land situations. This example applies to other herbicides and their product range.

2) Ensuring licensed and experience staff are used. While licensing is a legal requirement, ensuring staff have at least 12 month experience is more likely to ensure miss-use or careless use will not occur.

3) Ensuring post-spray operations are reported on at the end of each day. Data such as area and location sprayed, the type of spraying being conducted (eg footpaths), the herbicide used, the rate applied, the spray pressure applied, the wind speed and direction on site and the operator's name and vehicle registration, will ensure additional care is taken and any problems can be easily traced and action taken to overcome the problem in future operations.

4) Incorporating these and other appropriate specification in any tender and subsequent contract developed by the JCC. Possible examples include.....

- a. The contractor will follow all label and permit specifications.
- b. Where the herbicide is available in a number of different products the contractor will use the product with the broadest possible label specification.
- c. All operators must be licensed and have a minimum of 12 months experience.
- d. Hooded sprayers should be used where appropriate.
- e. The contractor will measure wind speed on site and cease all spraying if wind speeds exceed 20 km per hour or at label specifications which ever is lower.

- f. All equipment will be tested and calibrated prior to use and calibrations forwarded to the JCC.
- g. MSDS (Material Safety Data Sheets) will be kept on site by the contactor for each spraying operation.
- h. Any costs associated with non-target plant damage will be born by the contractor.
- i. Any herbicides used will be approved by an independent expert.
- j. After spraying operations the following information will be sent to the JCC at the end of each day. Data sheets should outline the area and location sprayed, the type of spraying being conducted, the pesticide used, the rate applied, the spray pressure applied, the wind speed and direction on site and the operator's name and vehicle registration.

Findings:

1) A summary of considerations is provided in Table 1.

2) As a generalization, herbicides are more cost effective and have better kill rates than thermal weed control methods. Their cost advantages and speed of application indicate that they are suitable for large scale operations. Cost comparisons include:

- Herbicide cost for pathway and roadside curb combination are \$90 to \$130 per operation compared with thermal which has a most common price range of \$165 to \$220.

- Weed control via herbicide application requires 2 to 3 applications per year for pathway and roadside curb combination while thermal treatment requires 3 to 6 applications per year.

- Assuming a low price of \$165 per operation for thermal weed control and 3 operations per year, the cost is \$495 while over the same period herbicide application at \$90 per operation with 2 operations per year is \$180. As a general rule therefore thermal weed control per year will be between 2 and 4 times more expensive than the application of herbicides.

3) Thermal weed control methods are best utilized where environmental or health issues are significant and where off site damage to non-target plants is a high risk.

4) The costs and speed at which thermal weed control can be undertaken may limit its scale of operation.

5) Weed control efficiency is improved if the frequency of thermal weed control is no longer then six weeks apart and, where there is an occurrence of perennial weeds which are hard to kill, hand weeding or herbicide spot spraying may be necessary on second cycle treatments.

Table 1 Shows a comparison of thermal weed control and the herbicides amitrole and glyphosate using different assessment criteria and different circumstances. The scores below are on a scale of zero to ten with higher scores indicating more positive attributes while lower scores indicate more negative attributes.

	Thermal weed control	Amitrole	Glyphosate
Cost effectiveness	4-6	9	8
Efficacy on annuals	8-9	9	9
Efficacy on perennials	5-6	8	8
Speed of operation	4	9	9
Need for follow up treatments	4	8-9	6-7
Off site impact	9	5-6	7-8
Environmental impact	9	6	8
Efficient water use	5	8	8
Overall rating	48-52 (60 - 65%)	62-64 (77-80%)	63-65 (78-81%)
Suitability to.....			
Large scale operations	4	9	9
Ovals/Parks	4	6	8
Garden beds	9	n/a	7-8
Paths	6-7*	n/a	9
Roadsides crub	6-7*	7	9
Health risk situations	9	n/a	5#
Environmentally sensitive situations	9	n/a	7
Sumps	2	9	8

* Scale of operation may be limited due to operational speed which impacts on the area that can be covered inside a reasonable time period. This is important as weeds need to be killed before seed set occurs and thermal operations will need to be completed at least twice over the same area no more then 6 weeks apart for effective weed control.

Mostly public perception rather than definable medical sensitivities although exceptions exist.

Recommendations:

1) The council should consider thermal weed control (hot water/steam) on a trail bases around residential areas where health risk situations are known, environmentally sensitive sites occur or where human foot traffic is very high.

Consideration in these circumstances needs to be given to the issue that thermal weed control contractors will require a minimum area/distance/time to make the exercise viable. It is estimated this will be 1 week's work, or 35 km of pathway and curb or an approximately cost of \$4,000 to \$6,000 for a single application. Independent records should be taken to determine existing weed density prior to treatment and subsequent densities at 2, 4 and 6 weeks after application. Future decisions on continuation or expansion of thermal weed control can include considerations of this data.

Note also that compared to the traditional weed control industries, the thermal weed control industry is young. Typically these circumstances can lead to large variations in pricing and quality of work. I would recommend caution where very cheap quotes are received and ensure steps are put in place to protect the Council's return on any funds outlaid. This includes specific contract specifications. The single largest complaint in the investigations of thermal weed control is weed control failure. The city should ensure any contract for thermal weed control specifies that two applications be completed between 4 and 6 weeks apart (no sooner or no latter) and that 90% weed control be achieved on inspection 5 weeks after the second thermal treatment.

Like herbicide applications thermal weed control can have problems when.....

- (a) the application temperature is too low,
- (b) the nozzle head is too far from the target weed,
- (c) the treatment time is too short,
- (d) the water rate is too low,
- (e) the target weeds are too large.

2) The council should consider that for large scale weed control the use of herbicides be resumed as they do not represent an undue risk to health or environment where label specifications are followed. Weed control using herbicides remains the most cost and time effective means of controlling weeds. Furthermore, delays in weed control will result in weeds becoming more tolerant (most weeds become more tolerant with age) and more likely to produce seed. Herbicides can be a problem when....

- (a) the incorrect herbicide is chosen/used,
- (b) the incorrect rate is applied,
- (c) the incorrect spray pressure is used,
- (d) the wind speed is too high,
- (e) the operator is careless in their application

To ensure these problems are avoided, it is suggest the council consider....

- (a) Engaging an expert to determine herbicide choice and rate specification.
- (b) Contracts with spray operators be examined carefully by a relevant expert and protective clauses added to emphasize quality control.
- (c) As part of the contract spraying operations, data sheets should be faxed/submitted to the JCC at the end of each day's operation. Data sheets should outline area and location sprayed, the type of spraying being conducted, the herbicide used, the rate applied, the spray pressure applied, the wind speed and direction on site and the operator's name and vehicle registration.

John Banks

and

Graeme Sandral

ITEM 3

RESPONSE TO REVIEW OF ADVISORY COMMITTEES
OF COUNCIL – [15058]

WARD: All

RESPONSIBLE
DIRECTOR: Mr Ian Cowie
Governance and Strategy

PURPOSE

To request that the Sustainability Advisory Committee considers Council report CJ174-10/06 'Review of Advisory Committees of Council' as referred to the Sustainability Advisory committee (SAC) by Council at its meeting of 10 October 2006.

EXECUTIVE SUMMARY

Council has referred its report 'Review of Advisory Committees of Council' to the relevant Committees for their information and comment. The report identifies four options in relation to the operation of Advisory Committees:

- Tailoring approaches to meet different objectives;
- Establishing a different Advisory Committee structure format;
- Induction and training for Advisory Committee members; and
- Developing a protocol for referrals between Council and its Advisory Committees.

BACKGROUND

At the meeting of Council on 10 October 2006, it was agreed that the Council report regarding the Review of Advisory Committees of Council be referred to the next available meeting of each of the City's Advisory Committees. Specifically, the resolution stated:

REFERS Report CJ174-10/06 – to the Committees for their information and comment.

DETAILS

Issues and options considered:

Attachment 1 provides a copy of the above report.

Link to Strategic Plan:

Outcome : The City of Joondalup is an interactive community.
Objective : 4.3: To ensure the City responds to and communicates with the community.
Strategies : 4.3.2: Provide fair and transparent decision making processes.

Legislation – Statutory Provisions:

The Advisory Committees have been established in accordance with provisions of the Local Government Act 1995 relating to Committees.

Risk Management Considerations:

Not applicable.

Financial/Budget Implications:

Not applicable.

Policy Implications:

Not applicable.

Regional Significance:

Not applicable.

Sustainability Implications:

Consideration of the report by the SAC will ensure the Council receives the most appropriate advice in this area.

Consultation:

The attached report considers the most appropriate ways for Council to engage with and consult the community.

COMMENT

Nil.

ATTACHMENTS

Attachment 1 Council Report CJ174 – 10/06

VOTING REQUIREMENTS

Simple majority

RECOMMENDATION

That the Sustainability Advisory Committee:

- 1 NOTES Council report CJ174-10/06 Review of Advisory Committees of the Council;
- 2 DETERMINES which of the report's options it supports.